

Variation in North American *Asplenium platyneuron*

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One of the most common and widespread of the eastern North American spleenworts is the Ebony Spleenwort, *Asplenium platyneuron* (L.) Oakes ex D. C. Eaton, which ranges from Quebec to Ontario, south to Colorado, Texas, Florida, and the West Indies. It is also known from South America and South Africa (Mohlenbrock, 1967, p. 157). Because it is a common, attractive, and variable species, a number of varieties and forms have been recognized by both professional pteridologists and amateur fern enthusiasts. We have found the literature to contain nine infraspecific names accounting for variations in frond and pinna form or in stipe and rachis branching or proliferations. The purpose of this paper is to account historically for these taxa, to review their taxonomy and nomenclature, and to provide a key for their identification. The stimulus for this report comes from the discovery of the striking cut-leaf variant *A. platyneuron* f. *hortonae*, which is reported here for the first time from Illinois. Our studies have revealed that much herbarium material of *A. platyneuron* is incompletely or incorrectly determined below the species level.

KEY TO INFRASPECIFIC TAXA OF NORTH AMERICAN ASPLENIUM PLATYNEURON

1. Stipe and rachis unbranched and not proliferous.
 2. Longest pinnae less than 3.5(4) cm long; pinnae subentire to nearly pinnatisect; erect fronds with or without sori.
 3. Pinnae subentire to crenulate or serrulate1a. var. *platyneuron*
 3. Pinnae doubly serrate to deeply incised or pinnatifid to pinnatisect.
 4. Pinnae doubly serrate to deeply incised; all or nearly all of the pinnae cut less than 4/5 of the way to the midvein; erect fronds normally soriferous.....1b. var. *incisum*
 4. Pinnae pinnatifid to pinnatisect; all or nearly all of the pinnae cleft more than 4/5 of the way to the midvein; fronds without sori.....1c. f. *hortonae*
 2. Longest pinnae more than 3.5 cm long; pinnae often coarsely serrate-incised; erect fronds normally soriferous.....1d. var. *bacculum-rubrum*
1. Stipe and/or rachis branched or proliferous.
 5. Stipe and/or rachis branched.....1e. f. *furcatum*
 5. Stipe and/or rachis proliferous1f. f. *proliferum*

1a. *Asplenium platyneuron* (L.) Oakes ex D. C. Eaton var. *platyneuron*, Ferns No. Amer. 1: 24. 1878.

Acrostichum platyneuros L. Sp. Pl. 2: 1069. 1753.

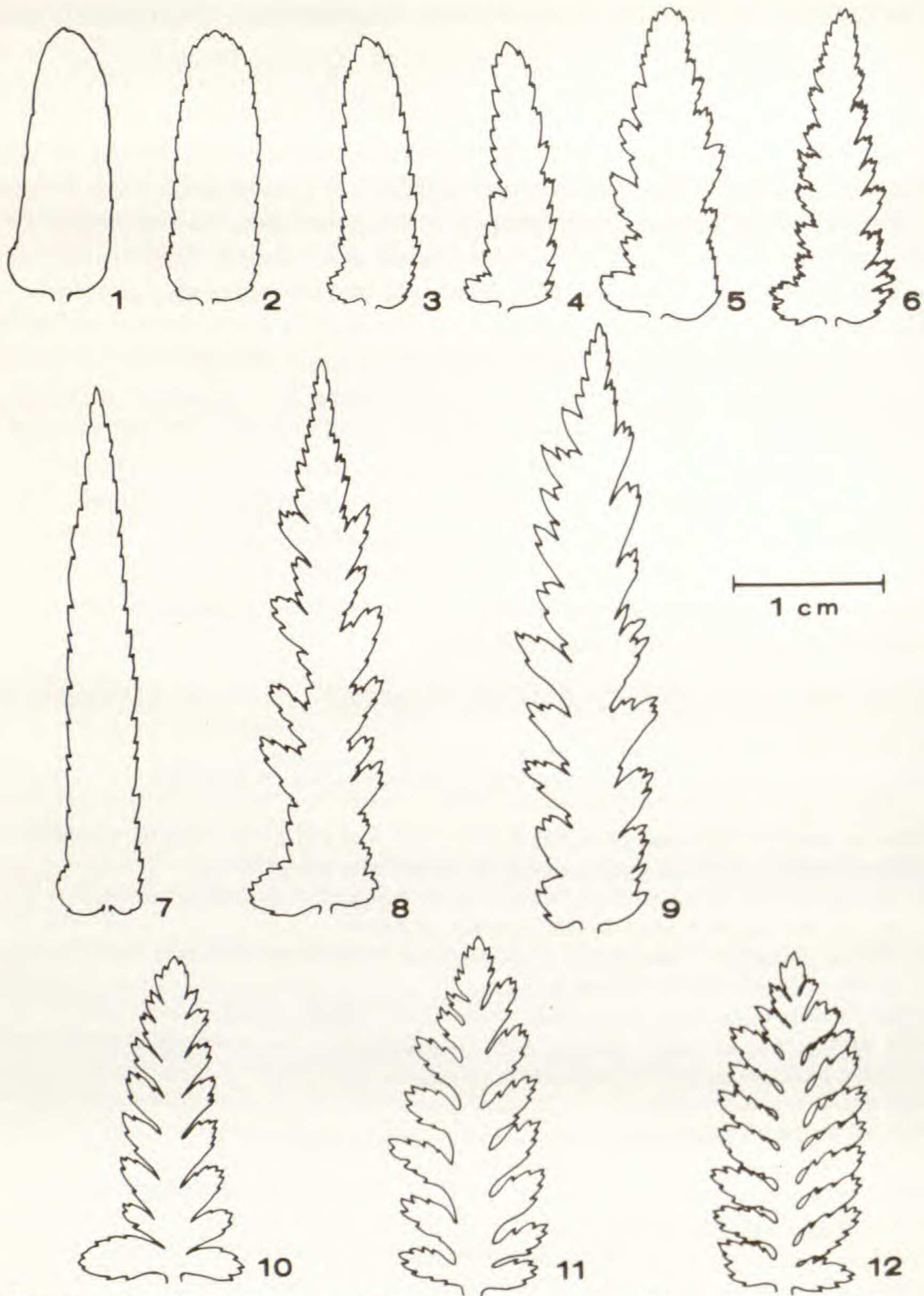
Asplenium ebeneum Ait. Hort. Kew. 3: 462. 1789.

Chamaefilix platyneuros (L.) Farw. Amer. Midl. Nat. 12: 269. 1931.

Most American botanists in the nineteenth century chose to use Aiton's name *A. ebeneum* for this species. Fernald (1935, pp. 382-384) discusses the difficulties in typifying *Acrostichum platyneuros*.

Typical *A. platyneuron* has erect fertile fronds up to 40 cm long with as many as 50 pairs of pinnae (Fernald, 1950) and a lustrous, dark brown, unbranched stipe

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Pinna forms in *Asplenium platyneuron*. FIG. 1. var. *platyneuron*, Montgomery Co., Ark., Taylor 1073 (SIU). FIG. 2. var. *platyneuron*, Sharp Co., Ark., Taylor 1819 (SIU). FIG. 3. var. *incisum*, Williamsburg Co., So. Car., Godfery & Tryon 443 (GH). FIG. 4. var. *incisum*, Garland Co., Ark., Demaree 68587 (SIU). FIG. 5. var. *incisum*, Fleming Co., Ky., Braun 1750 (GH). FIG. 6. var. *incisum*, Middlesex Co., Mass., Davenport *s.n.* (GH). FIGS. 7 and 8. var. *bacculum-rubrum*, Princess Anne Co., Va., Fernald & Long 12221 (GH). FIG. 9. var. *bacculum-rubrum*, Polk Co., Ark., Taylor 1061 (SIU). FIG. 10. f. *hortonae*, Rensselaer Co., N.Y., Harrison *s.n.* (GH). FIG. 11. f. *hortonae*, Jackson Co., Ill., Taylor 878 (SIU). FIG. 12. f. *hortonae*, Windham Co., Vt., Horton *s.n.* (GH).

and rachis (*Fig. 13*). The blade is linear-oblong or linear-oblong-lanceolate. Medial pinnae are oblong to oblong-lanceolate and auriculate at the base on their upper and also often on their lower margins. In addition, the pinnae are serrulate and rarely over 2 cm long (*Figs. 1-3*). Fernald (1950) described typical *A. platyneuron* as having "pinnae minutely crenulate, dentate or fine serrulate"; Morton (1952) referred to the pinnae of sterile fronds as "remotely serrulate" and those of the fertile fronds as "serrate."

1b. *Asplenium platyneuron* var. *incisum* (Howe ex Peck) B. L. Robins. *Rhodora* 10: 29. 1908.

Asplenium ebeneum var. *incisum* Howe ex Peck, Ann. Rep. Regents Univ. N.Y. 22: 104. 1869. TYPE: Poestenkill, Rennselaer County, New York, E. C. Howe (NYS, photos GH!).

Asplenium ebeneum var. *serratum* E. S. Miller, Bull. Torrey Bot. Club 4: 41. 1873. TYPE: Wading River, Suffolk Co., New York, E. S. Miller (not located).

Asplenium platyneuron var. *serratum* (E. S. Miller) B. S. P. Prelim. Cat. Pl. New York 73. 1888.

Asplenium ebeneum f. *serratum* (E. S. Miller) Clute, Our Ferns 314. 1901.

Asplenium platyneuron f. *serratum* (E. S. Miller) R. Hoffm. Boston Soc. Nat. Hist. 36: 193. 1922.

Chamaefilix platyneuros var. *serrata* (E. S. Miller) Farw. Amer. Midl. Nat. 12: 270. 1931.

The first variation based on pinna characters was described in 1869 by Peck as var. *incisum*: "In this form the pinnae are about one inch long, and all except the extreme upper and lower ones are deeply incised-pinnatifid; the pinnules are rather strongly 3-5 crenate toothed. I have thought best to give it the name suggested by its discoverer [Howe]." Howe's type material does possess several nearly pinnatifid pinnae; however, most of the pinnae are doubly serrate or serrate-incised. It appears that the doubly serrate or serrate-incised to nearly pinnatifid pinnae separate var. *incisum* (*Figs. 4-6*) from var. *platyneuron*, although numerous intermediates are readily found.

Essentially the same taxon was described by Miller "... with the fronds wider than usual and the segments very sharply serrate, which he [Miller] proposes to ticket at Dr. Gray's suggestion as var. *serratum*." Although we have been unable to locate Miller's specimens, an examination of authentic material, as determined by Asa Gray, indicates that both var. *serratum* and var. *incisum* are referable to the same variety.

1c. *Asplenium platyneuron* f. *hortonae* (Davenp.) L. B. Smith, *Rhodora* 30: 14. 1928.

Asplenium ebeneum var. *hortonae* Davenp. *Rhodora* 3: 1. 1901. TYPE: Brattleboro, Windham County, Vermont, Sept. 1900, F. B. Horton s.n. (isotypes GH!, US).

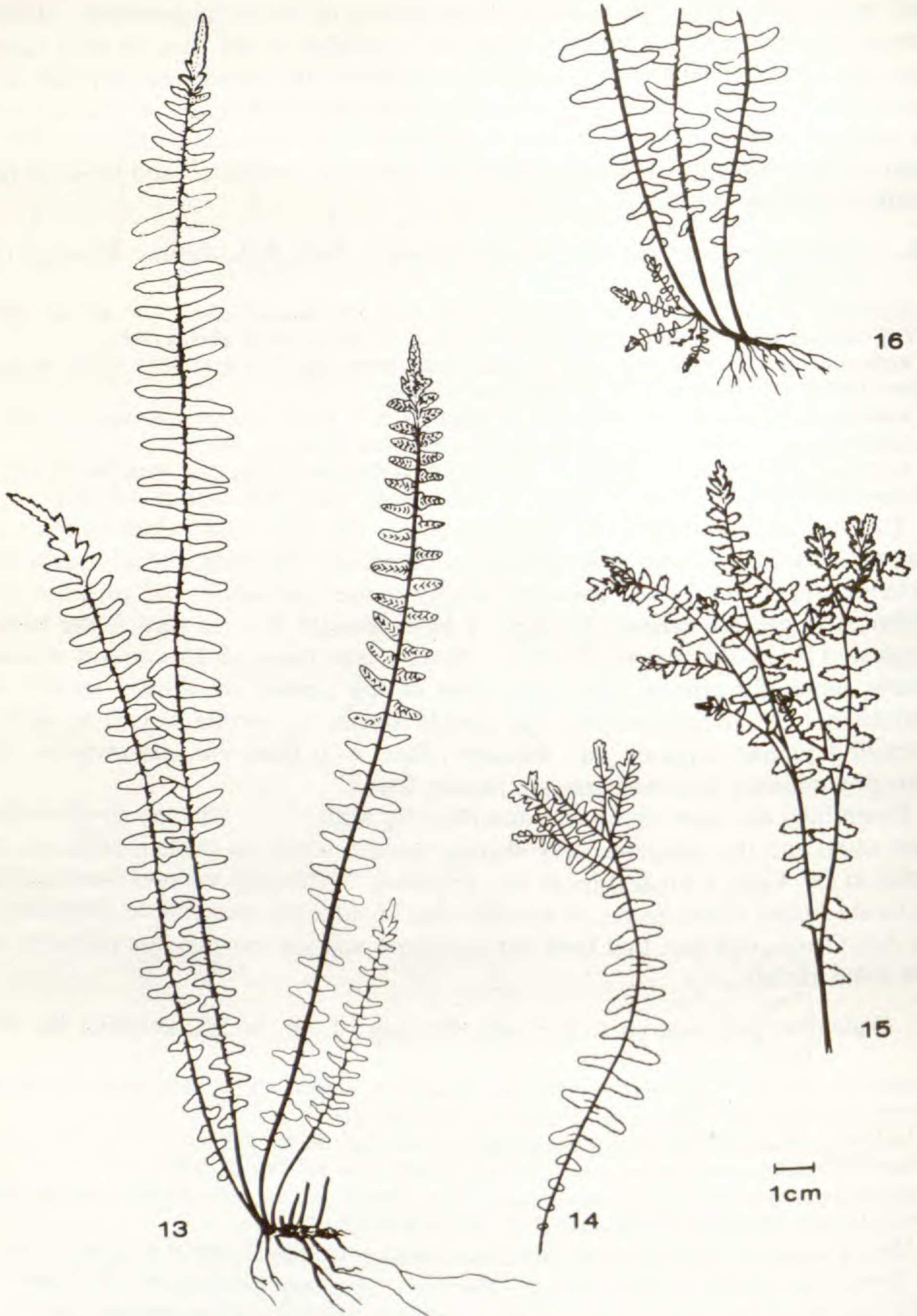
Asplenium ebeneum f. *hortonae* (Davenp.) Clute, Fern Bull. 14: 86. 1906.

Asplenium platyneuron var. *hortonae* (Davenp.) Clute, Fern Bull. 17: 21. 1909.

Asplenium platyneuron f. *dissectum* Bened. Amer. Fern J. 37: 11. 1947. TYPE: Lanedon, St. Mary's County, Maryland, 21 Oct 1945, J. E. Benedict 5230 (US!).

Mrs. Francis B. Horton first found the feathery-fronded form of *A. platyneuron* in September, 1900, in Brattleboro, Vermont. She sent material to Davenport, who described it as *A. ebeneum* var. *hortonae*. Davenport commented that the plant was so different in appearance that he first thought it to be a new species.

Asplenium platyneuron f. *hortonae* has been found only sterile. Its pinnae are deeply pinnatifid to pinnatisect, with the ultimate segments ovate to oblong or



Fronnd forms in *Asplenium platyneuron*. FIG. 13. var. *platyneuron*, Montgomery Co., Ark., Taylor 1073 (SIU). FIG. 14. f. *furcatum*, after Clute (1909). FIG. 15. f. "multifidum," Upshur Co., W. Va., Tetrick s.n. (WVA). FIG. 16. f. *proliferum*, after Marshall (1923).

obovate to spatulate and crenulate to serrulate-incised (*Figs. 10-12*). Due to its sporadic occurrence and distinctive appearance, Clute's treatment of this taxon as a form is quite logical, although some specimens approach var. *incisum* or var. *bacculum-rubrum*.

Asplenium platyneuron f. *hortonae* was found in Jackson County, Illinois, approximately 4 miles SW of Ava, SW $\frac{1}{4}$ of sect. 10, T8S, R4W, in July, 1971 (*Taylor 878*, SIU). A single plant occurs with several of var. *platyneuron* on a west-facing hillside woods dominated by *Quercus stellata*, *Q. velutina*, *Q. alba*, *Ulmus alata*, and *Carya ovalis*. Other species in the immediate vicinity of the plant include *Fraxinus americana*, *Ostrya virginiana*, *Eupatorium rugosum*, *Sanicula canadensis*, *Acalypha rhomboidea*, *Woodsia obtusa*, and *Botrychium dissectum* var. *obliquum*. The Illinois material of f. *hortonae* is sterile, with 22-28 pairs of deeply pinnatifid pinnae on fronds up to 35 cm long. The pinnae are up to 3.2 cm long, with the basal pair of lobes usually larger and often at right angles to the pinna midvein.

Benedict's f. *dissectum* is based on a large and much-divided specimen of *A. platyneuron*. Although three fronds of the Benedict specimen bear pinnae that are more divided than those of type material of f. *hortonae*, the other fronds are typical for f. *hortonae*. In addition, the Benedict specimen is sterile like those of all collections of f. *hortonae*. On the basis of pinna length alone, Benedict's collection, with pinnae up to 4 cm long, would fit the dimensions of var. *bacculum-rubrum*. However, its sterility and pinna dissection place it clearly with f. *hortonae*.

1d. *Asplenium platyneuron* var. *bacculum-rubrum* (Featherm.) Fern. Rhodora 38: 304. 1936.

Asplenium ebeneum var. *bacculum-rubrum* Featherm. Rep. Bot. Surv. So. Centr. Louisiana 1870: 75. 1871. TYPE: Near Baton Rouge, Louisiana, *Featherman* (not located).

Asplenium platyneuron var. *euroaustrinum* Fern. Rhodora 37: 382. 1935. TYPE: Munden, Princess Anne County, Virginia, 1 Aug 1934, *Fernald & Long 3603* (GH; isotype US).

Featherman described *A. ebeneum* var. *bacculum-rubrum* from plants found near Baton Rouge, Louisiana as follows: "Stipe and rachis purplish brown, glossy, tall, one to two feet high. Fronds linear, lanceolate, acuminate, pinnate. Pinnae numerous, sessile, auricled on both sides of the base, coarsely serrate, the pinnae below the middle gradually decreasing in length. Fruit-dots elongated, from twenty to thirty on each pinna. Pinnae distinct."

A year after Fernald described var. *euroaustrinum*, Fernald corrected his error when he made the combination *A. platyneuron* var. *bacculum-rubrum* (Featherm.) Fern. This mainly southern variety has fertile fronds which are up to 70 cm long, with each frond bearing up to 70 pairs of pinnae. The pinnae are frequently coarsely serrate-incised and are typically longer than 3.5 cm (*Figs. 7-9*). The entire aspect of this variety is coarser than that of var. *platyneuron* and, at its extremes, is found to intergrade with var. *incisum*.

1e. *Asplenium platyneuron* f. *furcatum* Clute, Fern Bull. 17: 89. 1909.

Asplenium platyneuron f. *multifidum* Tetrick, Amer. Fern J. 39: 92. 1949. TYPE: Upshur County, West Virginia, 21 June 1946, *R. M. Tetrick II* (WVA!).

TYPE: Asheville, Buncombe County, North Carolina, *Wright* (not located).

Clute's *f. furcatum* is based on a collection sent to him from Asheville, North Carolina by Miss Frances M. Wright and about which he states, "The plant was normal in all respects with the exception of the fronds . . . which were much branched at the apex." An illustration accompanies Clute's description (*Fig. 14*).

Apparently unaware of Clute's description, Tetrick described *f. multifidum* stating, "fronds much branched, the ultimate divisions crested." Comparing the holotype of *f. multifidum* with Clute's illustration of *f. furcatum* (*Figs. 14 and 15*), it appears that these two forms are essentially the same.

1f. *Asplenium platyneuron f. proliferum* (D. C. Eaton) Tanger, Amer. Fern J. 23: 16. 1933.

Asplenium ebeneum var. *proliferum* D. C. Eaton, Bull. Torrey Bot. Club 6: 307. 1879. TYPE: Near Ocala, Marion County, Florida, Mar-Apr 1879, *Capt. J. D. Smith*. (isotype US).

Asplenium ebeneum f. proliferum (D. C. Eaton) Clute, Fern Bull. 14: 86. 1906.

D. C. Eaton described var. *proliferum* from specimens collected by Captain J. D. Smith near Ocala, Florida. Proliferous plantlets are normally quite small, inconspicuous, and located near the base of the frond (*Fig. 16*). They have been noted on taxa otherwise referable to var. *platyneuron*, var. *incisum*, or var. *bacculum-rubrum*.

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